Center Independent Research & Development: GSFC IRAD

Graphene Transparent Conductive Electrodes

Completed Technology Project (2010 - 2012)

Project Introduction

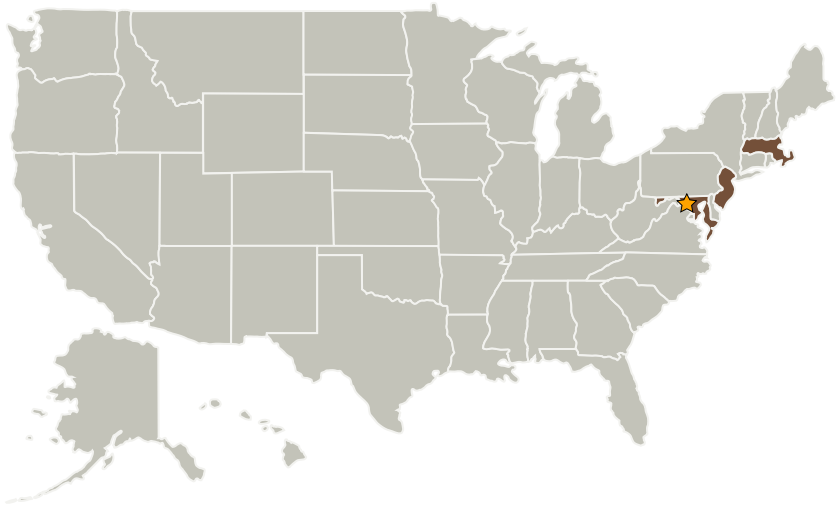
As an atomic layer of graphite, graphene has ultrahigh optical transparency and superior electron mobility. We plan to develop graphene transparent conductive electrodes (TCE) for applications in high density focal plane assemblies. The challenge is producing graphene TCE with high optical transparency, and meantime, low sheet resistance. Large area graphene is required for high density focal plane assemblies.

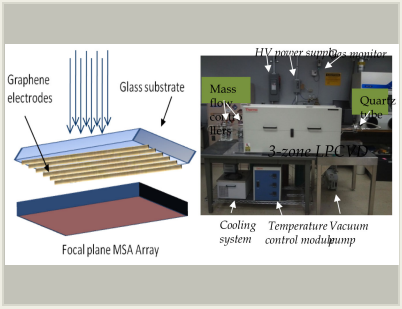
Graphene thin films will be fabricated using Low Pressure Chemical Vapor Deposition (LPCVD), Films will be selected and doped to reduce sheet resistance. The films will be patterned with electrical contacts in an array format. Optical transparency and electrical conductivity of the films will be characterized.

Anticipated Benefits

Dark energy missions

Primary U.S. Work Locations and Key Partners





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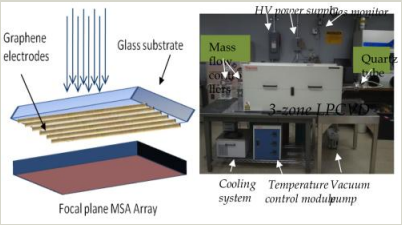
Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Massachusetts Institute of Technology(MIT)	Supporting Organization	Academia	Cambridge, Massachusetts
Stevens Institute of Technology	Supporting Organization	Industry	Hoboken, New Jersey
University of Maryland-College Park(UMCP)	Supporting Organization	Academia	College Park, Maryland

Primary U.S. Work Locations	
Maryland	Massachusetts
New Jersey	

Images



5158.jpg
Graphene Transparent Conductive Electrodes
(https://techport.nasa.gov/image/1309)

Project Website:

http://sciences.gsfc.nasa.gov/sed/

Organizational Responsibility

Responsible Mission Directorate:
Mission Support Directorate (MSD)

Lead Center / Facility:
Goddard Space Flight Center (GSFC)

Responsible Program:
Center Independent Research & Development: GSFC IRAD

Project Management

Program Manager:
Peter M Hughes

Project Manager:
Terence A Doiron

Principal Investigator:
Mary J Li

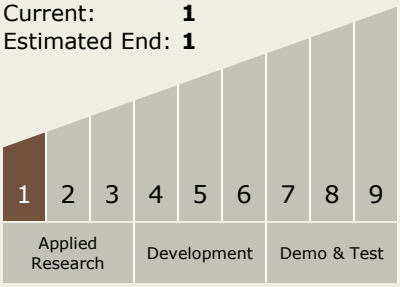
Co-Investigator:
Mahmooda Sultana

Graphene Transparent Conductive Electrodes

Completed Technology Project (2010 - 2012)

Technology Maturity (TRL)

Start: **1**
Current: **1**
Estimated End: **1**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes